

Meeting abstract

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Hospital waste water: health risk for human and environment by cytostatic drug emissions? Part I: Model calculation and chemical monitoring

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Project

"Chemical analysis, risk assessment and elimination of selected cytostatic agents from hospital waste water", performed at the University Hospital (AKH) Vienna.

Methods

Drugs: 5-fluorouracil, doxorubicin, epirubicin, daunorubicin, cisplatin, carboplatin, oxaliplatin. **Model calculation:** Minimum, maximum annual average concentrations and cumulative amount in hospital sewage were calculated. **Parameters:** drug, water consumption in the oncologic in-patient treatment ward, renal human excretion rate. **Chemical analysis:** platinum compounds: ICP-MS (speciation analysis by on-line coupling of HPLC to ICP-MS), limits of detection: cisplatin (0.09 µg/l), carboplatin (0.1 µg/l), oxaliplatin (0.15 µg/l). Anthracyclines: solid phase extraction, HPLC and fluorescence detection (FLD), limits of detection: doxorubicin (0.05 µg/l), daunorubicin (0.06 µg/l). 5-Fluorouracil: solid phase extraction, capillary electrophoresis, limit of detection 1.7 µg/l. **Chemical monitoring:** waste water samples: effluent of (a) the total hospital (TH), (b) the oncological

ward (OW), collected before dilution in the Vienna sewer system for a total period of 98 days.

Results

Pt concentrations ranged from 3.2 to 266 µg/l; estimates revealed that about one third of the administered drugs was detected in the waste water of the oncologic ward. 5-Fluorouracil was detected in waste water up to 124 µg/l, doxorubicin up to 1.35 µg/l. The concentrations determined chemically agreed with the predictions based upon model calculations.